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PATENT

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In re Application of:

R. Sanders Williams and
Beverly Rothermel

Serial No.: Unknown

Filed: February 13, 2001

For: METHODS AND COMPOSITIONS
RELATING TO MUSCLE SELECTIVE
CALCINEURIN INTERACTING
PROTEIN (MCIP)

Group Art Unit: Unknown

Examiner: Unknown

Atty. Dkt. No.: UTSD:674US

STATEMENT AS REQUIRED UNDER 37 C.F.R. § 1.821(f)

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Commissioner for Patents
Washington, D.C. 20231

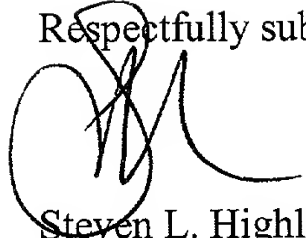
Commissioner:

Submitted herewith is a computer readable form and a paper copy of the sequence listing of those sequences in the captioned patent application. The computer readable form of the sequence listing is the same as the paper copy of the sequence listing. The sequence information provided in the Specification is also the same as the sequence listing of the enclosed computer readable and paper forms of the sequence listing.

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Date: February 13, 2001

Respectfully submitted,



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SEQUENCE LISTING

<110> WILLIAMS, R. SANDERS
ROTHERMEL, BEVERLY

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CALCINEURIN INTERACTING PROTEIN (MCIP)

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<213> Homo sapiens

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35 40 45
Lys Ser Phe Lys Arg Val Arg Ile Asn Phe Ser Asn Pro Phe Ser Ala
50 55 60
Ala Asp Ala Arg Leu Gln Leu His Lys Thr Glu Phe Leu Gly Lys Glu
65 70 75 80
Met Lys Leu Tyr Phe Ala Gln Thr Leu His Ile Gly Ser Ser His Leu
85 90 95
Ala Pro Pro Asn Pro Asp Lys Gln Phe Leu Ile Ser Pro Pro Ala Ser
100 105 110
Pro Pro Val Gly Trp Lys Gln Val Glu Asp Ala Thr Pro Val Ile Asn
115 120 125
Tyr Asp Leu Leu Tyr Ala Ile Ser Lys Leu Gly Pro Gly Glu Lys Tyr
130 135 140
Glu Leu His Ala Ala Thr Asp Thr Thr Pro Ser Val Val Val His Val
145 150 155 160
Cys Glu Ser Asp Gln Glu Lys Glu Glu Glu Glu Met Glu Arg Met
165 170 175
Arg Arg Pro Lys Pro Lys Ile Ile Gln Thr Arg Arg Pro Glu Tyr Thr
180 185 190
Pro Ile His Leu Ser
195

<210> 13
<211> 197
<212> PRT
<213> Homo sapiens

<400> 13

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Val Ala Asn Ser Asp Ile Phe Ser Glu Ser Glu Thr Arg Ala Lys Phe

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Pro Ile His Leu Ser
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 Asp Ile Thr Phe Gln Tyr Phe Lys Ser Phe Lys Arg Val Arg Ile Asn
 45 50 55

ttc agc aac ccc ttc tcc gca gca gat gcc agg ctc cag ctg cat aag 243
 Phe Ser Asn Pro Phe Ser Ala Ala Asp Ala Arg Leu Gln Leu His Lys
 60 65 70

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 Thr Glu Phe Leu Gly Lys Glu Met Lys Leu Tyr Phe Ala Gln Thr Leu
 75 80 85

cac ata gga agc tca cac ctg gct ccg cca aat cca gac aag cag ttt 339
 His Ile Gly Ser Ser His Leu Ala Pro Pro Asn Pro Asp Lys Gln Phe
 90 95 100 105

ctg atc tcc cct ccc gcc tct ccg cca gtg gga tgg aaa caa gtg gaa 387
 Leu Ile Ser Pro Pro Ala Ser Pro Pro Val Gly Trp Lys Gln Val Glu
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 125 130 135

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 140 145 150

ccc agc gtg gtg gtc cat gta tgt gag agt gat caa gag aag gag gaa 531
 Pro Ser Val Val Val His Val Cys Glu Ser Asp Gln Glu Lys Glu Glu
 155 160 165

gaa gag gaa atg gaa aga atg agg aga cct aag cca aaa att atc cag 579
 Glu Glu Glu Met Glu Arg Met Arg Arg Pro Lys Pro Lys Ile Ile Gln
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<212> PRT
<213> Homo sapiens

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His Leu Asp Pro Arg Val Phe Val Asp Gly Leu Cys Arg Ala Lys Phe
20 25 30

Glu Ser Leu Phe Arg Thr Tyr Asp Lys Asp Ile Thr Phe Gln Tyr Phe
35 40 45

Lys Ser Phe Lys Arg Val Arg Ile Asn Phe Ser Asn Pro Phe Ser Ala
50 55 60

1661009.1

Ala Asp Ala Arg Leu Gln Leu His Lys Thr Glu Phe Leu Gly Lys Glu
65 70 75 80

Met Lys Leu Tyr Phe Ala Gln Thr Leu His Ile Gly Ser Ser His Leu
85 90 95

Ala Pro Pro Asn Pro Asp Lys Gln Phe Leu Ile Ser Pro Pro Ala Ser
100 105 110

Pro Pro Val Gly Trp Lys Gln Val Glu Asp Ala Thr Pro Val Ile Asn
115 120 125

Tyr Asp Leu Leu Tyr Ala Ile Ser Lys Leu Gly Pro Gly Glu Lys Tyr
130 135 140

Glu Leu His Ala Ala Thr Asp Thr Thr Pro Ser Val Val Val His Val
145 150 155 160

Cys Glu Ser Asp Gln Glu Lys Glu Glu Glu Glu Met Glu Arg Met
165 170 175

Arg Arg Pro Lys Pro Lys Ile Ile Gln Thr Arg Arg Pro Glu Tyr Thr
180 185 190

Pro Ile His Leu Ser
195

<210> 16

<211> 197

<212> PRT

<213> Homo sapiens

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20 25 30

Glu Ser Leu Phe Arg Thr Tyr Asp Lys Asp Ile Thr Phe Gln Tyr Phe
35 40 45

Lys Ser Phe Lys Arg Val Arg Ile Asn Phe Ser Asn Pro Phe Ser Ala
50 55 60

Ala Asp Ala Arg Leu Gln Leu His Lys Thr Glu Phe Leu Gly Lys Glu
65 70 75 80

Met Lys Leu Tyr Phe Ala Gln Thr Leu His Ile Gly Ser Ser His Leu
85 90 95

Ala Pro Pro Asn Pro Asp Lys Gln Phe Leu Ile Ser Pro Pro Ala Ser
100 105 110

Pro Pro Val Gly Trp Lys Gln Val Glu Asp Ala Thr Pro Val Ile Asn
16

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Gly Asp Lys Leu His Leu Ala Pro Pro Gln Pro Ala Lys Gln Phe Leu	
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Ile Ser Pro Pro Ser Ser Pro Pro Val Ser Trp Gln Pro Ile Asn Asp	
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gcc acg cca gtc ctc aac tat gac ctc ctc tat gct gtg gcc aaa cta	615
Ala Thr Pro Val Leu Asn Tyr Asp Leu Leu Tyr Ala Val Ala Lys Leu	
125 130 135	
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Gly Pro Gly Glu Lys Tyr Glu Leu His Ala Gly Thr Glu Ser Thr Pro	
140 145 150	
agt gtc gtc gtg cac gtg tgc gac agt gac ata gag gaa gaa gag gac	711
Ser Val Val Val His Val Cys Asp Ser Asp Ile Glu Glu Glu Glu Asp	
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cca aag act tcc cca aag cca aaa atc atc caa act cgg cgt cct ggc	759
Pro Lys Thr Ser Pro Lys Pro Lys Ile Ile Gln Thr Arg Arg Pro Gly	
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Val Phe Thr Asn Gln Glu Val Lys Glu Lys Phe Gly Gly Leu Phe Arg
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Thr Tyr Asp Asp Cys Val Thr Phe Gln Leu Phe Lys Ser Phe Arg Arg
35 40 45

Val Arg Ile Asn Phe Ser Asn Pro Lys Ser Ala Ala Arg Ala Arg Ile
50 55 60

Glu Leu His Glu Thr Gln Phe Arg Gly Lys Lys Leu Lys Leu Tyr Phe
65 70 75 80

Ala Gln Val Gln Thr Pro Glu Thr Asp Gly Asp Lys Leu His Leu Ala
85 90 95

Pro Pro Gln Pro Ala Lys Gln Phe Leu Ile Ser Pro Pro Ser Ser Pro
100 105 110

Pro Val Ser Trp Gln Pro Ile Asn Asp Ala Thr Pro Val Leu Asn Tyr
115 120 125

Asp Leu Leu Tyr Ala Val Ala Lys Leu Gly Pro Gly Glu Lys Tyr Glu
130 135 140

Leu His Ala Gly Thr Glu Ser Thr Pro Ser Val Val Val His Val Cys
145 150 155 160

Asp Ser Asp Ile Glu Glu Glu Glu Asp Pro Lys Thr Ser Pro Lys Pro
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Lys Ile Ile Gln Thr Arg Arg Pro Gly Leu Pro Pro Ser Val Ser Asn
180 185 190

<210> 19

<211> 192

<212> PRT

<213> Homo sapiens

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Val Phe Thr Asn Gln Glu Val Lys Glu Lys Phe Gly Gly Leu Phe Arg
20 25 30

Thr Tyr Asp Asp Cys Val Thr Phe Gln Leu Phe Lys Ser Phe Arg Arg
35 40 45

Val Arg Ile Asn Phe Ser Asn Pro Lys Ser Ala Ala Arg Ala Arg Ile
50 55 60

Glu Leu His Glu Thr Gln Phe Arg Gly Lys Lys Leu Lys Leu Tyr Phe
65 70 75 80

Ala Gln Val Gln Thr Pro Glu Thr Asp Gly Asp Lys Leu His Leu Ala
85 90 95

Pro Pro Gln Pro Ala Lys Gln Phe Leu Ile Ser Pro Pro Ser Ser Pro
100 105 110

Pro Val Ser Trp Gln Pro Ile Asn Asp Ala Thr Pro Val Leu Asn Tyr
115 120 125

Asp Leu Leu Tyr Ala Val Ala Lys Leu Gly Pro Gly Glu Lys Tyr Glu
130 135 140

Leu His Ala Gly Thr Glu Ser Thr Pro Ser Val Val Val His Val Cys
145 150 155 160

Asp Ser Asp Ile Glu Glu Glu Glu Asp Pro Lys Thr Ser Pro Lys Pro
165 170 175

Lys Ile Ile Gln Thr Arg Arg Pro Gly Leu Pro Pro Ser Val Ser Asn
180 185 190

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<211> 828

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (23)..(745)

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gat agc cag tca gat ctg tgt agc act gac caa gaa gag gaa gaa gag 100
Asp Ser Gln Ser Asp Leu Cys Ser Thr Asp Gln Glu Glu Glu Glu Glu
15 20 25

atg att ttt ggt gaa aat gaa gat gat ttg gat gag atg atg gat tta 148
Met Ile Phe Gly Glu Asn Glu Asp Asp Leu Asp Glu Met Met Asp Leu
30 35 40

agt gat ctg cct acc tca ctt ttt gct tgc agc gtc cat gaa gca gtg 196
Ser Asp Leu Pro Thr Ser Leu Phe Ala Cys Ser Val His Glu Ala Val
45 50 55

ttt gag gca cga gag cag aag gaa aga ttt gaa gca ctc ttc acc atc 244
Phe Glu Ala Arg Glu Gln Lys Glu Arg Phe Glu Ala Leu Phe Thr Ile

60

65

70

tat gat gac cag gtt act ttt cag ctg ttt aaa agc ttt aga aga gtc 292
 Tyr Asp Asp Gln Val Thr Phe Gln Leu Phe Lys Ser Phe Arg Arg Val
 75 80 85 90

aga ata aat ttc agc aaa cct gaa gcg gca gca aga gcg cga ata gaa 340
 Arg Ile Asn Phe Ser Lys Pro Glu Ala Ala Ala Arg Ala Arg Ile Glu
 95 100 105

ctc cac gaa aca gac ttc aat ggg cag aag cta aag cta tat ttt gca 388
 Leu His Glu Thr Asp Phe Asn Gly Gln Lys Leu Lys Leu Tyr Phe Ala
 110 115 120

cag gtg cag atg tcc ggc gaa gtg cgg gac aag tcc tat ctc ctg ccg 436
 Gln Val Gln Met Ser Gly Glu Val Arg Asp Lys Ser Tyr Leu Leu Pro
 125 130 135

ccc cag cct gtc aag cag ttc ctc atc tcc cct cca gcc tct ccc cca 484
 Pro Gln Pro Val Lys Gln Phe Leu Ile Ser Pro Pro Ala Ser Pro Pro
 140 145 150

gtg ggg tgg aag cag agc gaa gat gcg atg cct gtt ata aat tat gat 532
 Val Gly Trp Lys Gln Ser Glu Asp Ala Met Pro Val Ile Asn Tyr Asp
 155 160 165 170

tta ctc tgt gct gtt tcc aaa ttg gga cca gga gag aaa tat gaa ctt 580
 Leu Leu Cys Ala Val Ser Lys Leu Gly Pro Gly Glu Lys Tyr Glu Leu
 175 180 185

cac gcg gga aca gag tcg aca ccc agc gtg gtg gtt cat gtc tgt gaa 628
 His Ala Gly Thr Glu Ser Thr Pro Ser Val Val Val His Val Cys Glu
 190 195 200

agt gaa act gaa gag gaa gaa gag aca aaa aac ccc aaa cag aaa att 676
 Ser Glu Thr Glu Glu Glu Glu Glu Thr Lys Asn Pro Lys Gln Lys Ile
 205 210 215

gcc cag aca agg cgc ccc gac cct ccg acc gca gcg ttg aat gag ccc 724
 Ala Gln Thr Arg Arg Pro Asp Pro Pro Thr Ala Ala Leu Asn Glu Pro
 220 225 230

cag acc ttt gat tgc gcg ctg tgaggccctt gggtgtggtg cgaggcggct 775
 Gln Thr Phe Asp Cys Ala Leu
 235 240

gccctggtgg gctctggcca tggcgctctg tgctgcggc cgatgcgttg ctg 828

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<211> 241

<212> PRT

<213> Homo sapiens

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 Glu Asp Asp Leu Asp Glu Met Met Asp Leu Ser Asp Leu Pro Thr Ser
 35 40 45
 Leu Phe Ala Cys Ser Val His Glu Ala Val Phe Glu Ala Arg Glu Gln
 50 55 60
 Lys Glu Arg Phe Glu Ala Leu Phe Thr Ile Tyr Asp Asp Gln Val Thr
 65 70 75 80
 Phe Gln Leu Phe Lys Ser Phe Arg Arg Val Arg Ile Asn Phe Ser Lys
 85 90 95
 Pro Glu Ala Ala Ala Arg Ala Arg Ile Glu Leu His Glu Thr Asp Phe
 100 105 110
 Asn Gly Gln Lys Leu Lys Leu Tyr Phe Ala Gln Val Gln Met Ser Gly
 115 120 125
 Glu Val Arg Asp Lys Ser Tyr Leu Leu Pro Pro Gln Pro Val Lys Gln
 130 135 140
 Phe Leu Ile Ser Pro Pro Ala Ser Pro Pro Val Gly Trp Lys Gln Ser
 145 150 155 160
 Glu Asp Ala Met Pro Val Ile Asn Tyr Asp Leu Leu Cys Ala Val Ser
 165 170 175
 Lys Leu Gly Pro Gly Glu Lys Tyr Glu Leu His Ala Gly Thr Glu Ser
 180 185 190
 Thr Pro Ser Val Val Val His Val Cys Glu Ser Glu Thr Glu Glu Glu
 195 200 205
 Glu Glu Thr Lys Asn Pro Lys Gln Lys Ile Ala Gln Thr Arg Arg Pro
 210 215 220
 Asp Pro Pro Thr Ala Ala Leu Asn Glu Pro Gln Thr Phe Asp Cys Ala
 225 230 235 240
 Leu

<210> 22
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 <212> PRT
 <213> Homo sapiens

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 35 40 45
 Leu Phe Ala Cys Ser Val His Glu Ala Val Phe Glu Ala Arg Glu Gln
 50 55 60
 Lys Glu Arg Phe Glu Ala Leu Phe Thr Ile Tyr Asp Asp Gln Val Thr
 65 70 75 80
 Phe Gln Leu Phe Lys Ser Phe Arg Arg Val Arg Ile Asn Phe Ser Lys
 85 90 95
 Pro Glu Ala Ala Ala Arg Ala Arg Ile Glu Leu His Glu Thr Asp Phe
 100 105 110
 Asn Gly Gln Lys Leu Lys Leu Tyr Phe Ala Gln Val Gln Met Ser Gly
 115 120 125
 Glu Val Arg Asp Lys Ser Tyr Leu Leu Pro Pro Gln Pro Val Lys Gln
 130 135 140
 Phe Leu Ile Ser Pro Pro Ala Ser Pro Pro Val Gly Trp Lys Gln Ser
 145 150 155 160
 Glu Asp Ala Met Pro Val Ile Asn Tyr Asp Leu Leu Cys Ala Val Ser
 165 170 175
 Lys Leu Gly Pro Gly Glu Lys Tyr Glu Leu His Ala Gly Thr Glu Ser
 180 185 190
 Thr Pro Ser Val Val Val His Val Cys Glu Ser Glu Thr Glu Glu Glu
 195 200 205
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 225 230 235 240
 Leu

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<220>
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 <222> (2)..(637)

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Leu Asp Glu Met Met Asp Leu Ser Asp Leu Pro Thr Ser Leu Phe Ala	
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Cys Ser Val His Glu Ala Val Phe Glu Ala Arg Glu Gln Lys Glu Arg	
35 40 45	
ttt gaa gca ctc ttc acc atc tat gat gac cag gtt act ttt cag ctg	193
Phe Glu Ala Leu Phe Thr Ile Tyr Asp Asp Gln Val Thr Phe Gln Leu	
50 55 60	
ttt aaa agc ttt aga aga gtc aga ata aat ttc agc aaa cct gaa gcg	241
Phe Lys Ser Phe Arg Arg Val Arg Ile Asn Phe Ser Lys Pro Glu Ala	
65 70 75 80	
gca gca aga gcg cga ata gaa ctc cac gaa aca gac ttc aat ggg cag	289
Ala Ala Arg Ala Arg Ile Glu Leu His Glu Thr Asp Phe Asn Gly Gln	
85 90 95	
aag cta aag cta tat ttt gca cag tcc tat ctc ctg ccg ccc cag cct	337
Lys Leu Lys Leu Tyr Phe Ala Gln Ser Tyr Leu Leu Pro Pro Gln Pro	
100 105 110	
gtc aag cag ttc ctc atc tcc cct cca gcc tct ccc cca gtg ggg tgg	385
Val Lys Gln Phe Leu Ile Ser Pro Pro Ala Ser Pro Pro Val Gly Trp	
115 120 125	
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Lys Gln Ser Glu Asp Ala Met Pro Val Ile Asn Tyr Asp Leu Leu Cys	
130 135 140	
gct gtt tcc aaa ttg gga cca gga gag aaa tat gaa ctt cac gcg gga	481
Ala Val Ser Lys Leu Gly Pro Gly Glu Lys Tyr Glu Leu His Ala Gly	
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aca gag tcg aca ccc agc gtg gtg gtt cat gtc tgt gaa agt gaa act	529
Thr Glu Ser Thr Pro Ser Val Val Val His Val Cys Glu Ser Glu Thr	
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Glu Glu Glu Glu Glu Thr Lys Asn Pro Lys Gln Lys Ile Ala Gln Thr	
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Arg Arg Pro Asp Pro Pro Thr Ala Ala Leu Asn Glu Pro Gln Thr Phe	
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65 70 75 80

Lys Leu Lys Leu Tyr Phe Ala Gln Ser Tyr Leu Leu Pro Pro Gln Pro
100 105 110

Lys Gln Ser Glu Asp Ala Met Pro Val Ile Asn Tyr Asp Leu Leu Cys
130 135 140

Ala Val Ser Lys Leu Gly Pro Gly Glu Lys Tyr Glu Leu His Ala Gly
145 150 155 160

Thr Glu Ser Thr Pro Ser Val Val Val His Val Cys Glu Ser Glu Thr
165 170 175

Glu Glu Glu Glu Glu Thr Lys Asn Pro Lys Gln Lys Ile Ala Gln Thr
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 Phe Glu Ala Leu Phe Thr Ile Tyr Asp Asp Gln Val Thr Phe Gln Leu
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 Phe Lys Ser Phe Arg Arg Val Arg Ile Asn Phe Ser Lys Pro Glu Ala
 65 70 75 80
 Ala Ala Arg Ala Arg Ile Glu Leu His Glu Thr Asp Phe Asn Gly Gln
 85 90 95
 Lys Leu Lys Leu Tyr Phe Ala Gln Ser Tyr Leu Leu Pro Pro Gln Pro
 100 105 110
 Val Lys Gln Phe Leu Ile Ser Pro Pro Ala Ser Pro Pro Val Gly Trp
 115 120 125
 Lys Gln Ser Glu Asp Ala Met Pro Val Ile Asn Tyr Asp Leu Leu Cys
 130 135 140
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 145 150 155 160
 Thr Glu Ser Thr Pro Ser Val Val Val His Val Cys Glu Ser Glu Thr
 165 170 175
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SEQUENCE LISTING

<110> WILLIAMS, R. SANDERS
ROTHERMEL, BEVERLY

<120> METHODS AND COMPOSITIONS RELATING TO MUSCLE SELECTIVE
CALCINEURIN INTERACTING PROTEIN (MCIP)

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<150> 60/216,601

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His Leu Asp Pro Arg Val Phe Val Asp Gly Leu Cys Arg Ala Lys Phe	
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gaa tcc ctc ttc aga aca tat gac aag gac acc acc ttc cag tat ttt	144
Glu Ser Leu Phe Arg Thr Tyr Asp Lys Asp Thr Thr Phe Gln Tyr Phe	
35 40 45	
aag agc ttc aaa cgt gtc cgg ata aac ttc agc aac ccc tta tct gca	192
Lys Ser Phe Lys Arg Val Arg Ile Asn Phe Ser Asn Pro Leu Ser Ala	
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Ala Asp Ala Arg Leu Arg Leu His Lys Thr Glu Phe Leu Gly Lys Glu	
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Ala Pro Pro Asn Pro Asp Lys Gln Phe Leu Ile Ser Pro Pro Ala Ser	
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Pro Pro Val Gly Trp Lys Gln Val Glu Asp Ala Thr Pro Val Ile Asn	
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Tyr Asp Leu Leu Tyr Ala Ile Ser Lys Leu Gly Pro Gly Glu Lys Tyr	
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Glu Leu His Ala Ala Thr Asp Pro Thr Pro Ser Val Val Val His Val	
145 150 155 160	
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Cys Glu Ser Asp Gln Glu Asn Glu Glu Glu Glu Glu Glu Met Glu Arg	
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597

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Lys Ser Phe Lys Arg Val Arg Ile Asn Phe Ser Asn Pro Leu Ser Ala
50 55 60
Ala Asp Ala Arg Leu Arg Leu His Lys Thr Glu Phe Leu Gly Lys Glu
65 70 75 80
Met Lys Leu Tyr Phe Ala Gln Thr Leu His Ile Gly Ser Ser His Leu
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Ala Pro Pro Asn Pro Asp Lys Gln Phe Leu Ile Ser Pro Pro Ala Ser
100 105 110
Pro Pro Val Gly Trp Lys Gln Val Glu Asp Ala Thr Pro Val Ile Asn
115 120 125
Tyr Asp Leu Leu Tyr Ala Ile Ser Lys Leu Gly Pro Gly Glu Lys Tyr
130 135 140
Glu Leu His Ala Ala Thr Asp Pro Thr Pro Ser Val Val Val His Val
145 150 155 160
Cys Glu Ser Asp Gln Glu Asn Glu Glu Glu Glu Glu Glu Met Glu Arg
165 170 175
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Thr Pro Ile His Leu Ser

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Lys Ser Phe Lys Arg Val Arg Ile Asn Phe Ser Asn Pro Leu Ser Ala
 50 55 60

Ala Asp Ala Arg Leu Arg Leu His Lys Thr Glu Phe Leu Gly Lys Glu
 65 70 75 80

Met Lys Leu Tyr Phe Ala Gln Thr Leu His Ile Gly Ser Ser His Leu
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Pro Pro Val Gly Trp Lys Gln Val Glu Asp Ala Thr Pro Val Ile Asn
 115 120 125

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 Glu Ser Leu Phe Arg Thr Tyr Asp Lys Asp Thr Thr Phe Gln Tyr Phe
 35 40 45
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 Lys Ser Phe Lys Arg Val Arg Ile Asn Phe Ser Asn Pro Leu Ser Ala
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 Met Lys Leu Tyr Phe Ala Gln Thr Leu His Ile Gly Ser Ser His Leu
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 Pro Pro Val Gly Trp Lys Gln Val Glu Asp Ala Thr Pro Val Ile Asn
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 Tyr Asp Leu Leu Tyr Ala Ile Ser Lys Leu Gly Pro Gly Glu Lys Tyr
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gaa ctg cat gca gcg aca gac ccc act ccc agt gtg gtg gtc cac gtg 480
 Glu Leu His Ala Ala Thr Asp Pro Thr Pro Ser Val Val Val His Val
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Lys Ser Phe Lys Arg Val Arg Ile Asn Phe Ser Asn Pro Leu Ser Ala
 50 55 60

Ala Asp Ala Arg Leu Arg Leu His Lys Thr Glu Phe Leu Gly Lys Glu
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Met Lys Leu Tyr Phe Ala Gln Thr Leu His Ile Gly Ser Ser His Leu
 85 90 95

Ala Pro Pro Asn Pro Asp Lys Gln Phe Leu Ile Ser Pro Pro Ala Ser
 100 105 110

Pro Pro Val Gly Trp Lys Gln Val Glu Asp Ala Thr Pro Val Ile Asn
 115 120 125

Tyr Asp Leu Leu Tyr Ala Ile Ser Lys Leu Gly Pro Gly Glu Lys Tyr

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135

140

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Cys Glu Ser Asp Gln Glu Asn Glu Glu Glu Glu Glu Glu Met Glu Arg
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Lys Ser Phe Lys Arg Val Arg Ile Asn Phe Ser Asn Pro Leu Ser Ala
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Ala Asp Ala Arg Leu Arg Leu His Lys Thr Glu Phe Leu Gly Lys Glu
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Ala Pro Pro Asn Pro Asp Lys Gln Phe Leu Ile Ser Pro Pro Ala Ser
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Pro Pro Val Gly Trp Lys Gln Val Glu Asp Ala Thr Pro Val Ile Asn
 115 120 125

Tyr Asp Leu Leu Tyr Ala Ile Ser Lys Leu Gly Pro Gly Glu Lys Tyr
 130 135 140

Glu Leu His Ala Ala Thr Asp Pro Thr Pro Ser Val Val Val His Val
145 150 155 160

Cys Glu Ser Asp Gln Glu Asn Glu Glu Glu Glu Glu Met Glu Arg
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Thr Pro Ile His Leu Ser
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gag gga ctg ttc cgg acc tat gat gaa tgt gtg acg ttc cag ctg ttt 144
Glu Gly Leu Phe Arg Thr Tyr Asp Glu Cys Val Thr Phe Gln Leu Phe
35 40 45
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Lys Ser Phe Arg Arg Val Arg Ile Asn Phe Ser His Pro Lys Ser Ala
50 55 60
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Ala Arg Ala Arg Ile Glu Leu His Glu Thr Gln Phe Arg Gly Lys Lys
65 70 75 80
cta aaa ctc tac ttc gcc cag gtc cag acc cca gag aca gat gga gac 288
Leu Lys Leu Tyr Phe Ala Gln Val Gln Thr Pro Glu Thr Asp Gly Asp
85 90 95

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 Lys Leu His Leu Ala Pro Pro Gln Pro Ala Lys Gln Phe Leu Ile Ser
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 Pro Pro Ser Ser Pro Pro Val Gly Trp Lys Pro Ile Ser Asp Ala Thr
 115 120 125

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 Pro Val Leu Asn Tyr Asp Leu Leu Tyr Ala Val Ala Lys Leu Gly Pro
 130 135 140

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 Gly Glu Lys Tyr Glu Leu His Ala Gly Thr Glu Ser Thr Pro Ser Val
 145 150 155 160

gtg gtg cat gtg tgt gac agc gac atg gag gag gag gag gac cca aag 528
 Val Val His Val Cys Asp Ser Asp Met Glu Glu Glu Glu Asp Pro Lys
 165 170 175

act tcc ccc aag cca aaa atc att cag acc cgg cgt ccg ggc ttg cca 576
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 180 185 190

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70

75

80

Leu Lys Leu Tyr Phe Ala Gln Val Gln Thr Pro Glu Thr Asp Gly Asp
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Lys Leu His Leu Ala Pro Pro Gln Pro Ala Lys Gln Phe Leu Ile Ser
100 105 110

Pro Pro Ser Ser Pro Pro Val Gly Trp Lys Pro Ile Ser Asp Ala Thr
115 120 125

Pro Val Leu Asn Tyr Asp Leu Leu Tyr Ala Val Ala Lys Leu Gly Pro
130 135 140

Gly Glu Lys Tyr Glu Leu His Ala Gly Thr Glu Ser Thr Pro Ser Val
145 150 155 160

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Pro Ser Val Ser Asn
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<213> Mus musculus

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35 40 45

Lys Ser Phe Arg Arg Val Arg Ile Asn Phe Ser His Pro Lys Ser Ala
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Ala Arg Ala Arg Ile Glu Leu His Glu Thr Gln Phe Arg Gly Lys Lys
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Leu Lys Leu Tyr Phe Ala Gln Val Gln Thr Pro Glu Thr Asp Gly Asp
85 90 95

Lys Leu His Leu Ala Pro Pro Gln Pro Ala Lys Gln Phe Leu Ile Ser
100 105 110

Pro Pro Ser Ser Pro Pro Val Gly Trp Lys Pro Ile Ser Asp Ala Thr
115 120 125

Pro Val Leu Asn Tyr Asp Leu Leu Tyr Ala Val Ala Lys Leu Gly Pro
130 135 140

Gly Glu Lys Tyr Glu Leu His Ala Gly Thr Glu Ser Thr Pro Ser Val
145 150 155 160

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cgcttttact gtaagaaagc aag atg cat ttt aga aac ttt aac tac agt ttt 173
Met His Phe Arg Asn Phe Asn Tyr Ser Phe
1 5 10

agc tcc ctg att gcc tgt gtg gca aac agt gat atc ttc agc gaa agt 221
Ser Ser Leu Ile Ala Cys Val Ala Asn Ser Asp Ile Phe Ser Glu Ser
15 20 25

gaa acc agg gcc aaa ttt gag tcc ctc ttt agg acg tat gac aag gac 269
 Glu Thr Arg Ala Lys Phe Glu Ser Leu Phe Arg Thr Tyr Asp Lys Asp
 30 35 40

atc acc ttt cag tat ttt aag agc ttc aaa cga gtc aga ata aac ttc 317
 Ile Thr Phe Gln Tyr Phe Lys Ser Phe Lys Arg Val Arg Ile Asn Phe
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gag ttt ctg gga aag gaa atg aag tta tat ttt gct cag acc tta cac 413
 Glu Phe Leu Gly Lys Glu Met Lys Leu Tyr Phe Ala Gln Thr Leu His
 75 80 85 90

ata gga agc tca cac ctg gct ccg cca aat cca gac aag cag ttt ctg 461
 Ile Gly Ser Ser His Leu Ala Pro Pro Asn Pro Asp Lys Gln Phe Leu
 95 100 105

atc tcc cct ccc gcc tct ccg cca gtg gga tgg aaa caa gtg gaa gat 509
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 110 115 120

gcg acc cca gtc ata aac tat gat ctc tta tat gcc atc tcc aag ctg 557
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 Gly Pro Gly Glu Lys Tyr Glu Leu His Ala Ala Thr Asp Thr Thr Pro
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agc gtg gtg gtc cat gta tgt gag agt gat caa gag aag gag gaa gaa 653
 Ser Val Val Val His Val Cys Glu Ser Asp Gln Glu Lys Glu Glu Glu
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gag gaa atg gaa aga atg agg aga cct aag cca aaa att atc cag acc 701
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agg agg ccg gag tac acg ccg atc cac ctc agc tgaactggca cgcgacgagg 754
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<212> PRT

<213> Homo sapiens

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35 40 45

Lys Ser Phe Lys Arg Val Arg Ile Asn Phe Ser Asn Pro Phe Ser Ala
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Ala Asp Ala Arg Leu Gln Leu His Lys Thr Glu Phe Leu Gly Lys Glu
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Met Lys Leu Tyr Phe Ala Gln Thr Leu His Ile Gly Ser Ser His Leu
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Ala Pro Pro Asn Pro Asp Lys Gln Phe Leu Ile Ser Pro Pro Ala Ser
100 105 110

Pro Pro Val Gly Trp Lys Gln Val Glu Asp Ala Thr Pro Val Ile Asn
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Tyr Asp Leu Leu Tyr Ala Ile Ser Lys Leu Gly Pro Gly Glu Lys Tyr
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Glu Leu His Ala Ala Thr Asp Thr Thr Pro Ser Val Val Val His Val
145 150 155 160

Cys Glu Ser Asp Gln Glu Lys Glu Glu Glu Glu Glu Met Glu Arg Met
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Arg Arg Pro Lys Pro Lys Ile Ile Gln Thr Arg Arg Pro Glu Tyr Thr
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Pro Ile His Leu Ser
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 Lys Ser Phe Lys Arg Val Arg Ile Asn Phe Ser Asn Pro Phe Ser Ala
 50 55 60
 Ala Asp Ala Arg Leu Gln Leu His Lys Thr Glu Phe Leu Gly Lys Glu
 65 70 75 80
 Met Lys Leu Tyr Phe Ala Gln Thr Leu His Ile Gly Ser Ser His Leu
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 Ala Pro Pro Asn Pro Asp Lys Gln Phe Leu Ile Ser Pro Pro Ala Ser
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 Pro Pro Val Gly Trp Lys Gln Val Glu Asp Ala Thr Pro Val Ile Asn
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 Tyr Asp Leu Leu Tyr Ala Ile Ser Lys Leu Gly Pro Gly Glu Lys Tyr
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 Arg Arg Pro Lys Pro Lys Ile Ile Gln Thr Arg Arg Pro Glu Tyr Thr
 180 185 190
 Pro Ile His Leu Ser
 195

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gaa gag gaa atg gaa aga atg agg aga cct aag cca aaa att atc cag 579
 Glu Glu Glu Met Glu Arg Met Arg Arg Pro Lys Pro Lys Ile Ile Gln
 170 175 180 185

acc agg agg ccg gag tac acg ccg atc cac ctc agc tgaactggca 625
 Thr Arg Arg Pro Glu Tyr Thr Pro Ile His Leu Ser
 190 195

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<211> 197

<212> PRT

<213> Homo sapiens

<400> 15

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Glu	Ser	Leu	Phe	Arg	Thr	Tyr	Asp	Lys	Asp	Ile	Thr	Phe	Gln	Tyr	Phe
		35					40					45			

Lys	Ser	Phe	Lys	Arg	Val	Arg	Ile	Asn	Phe	Ser	Asn	Pro	Phe	Ser	Ala
	50					55					60				

Ala	Asp	Ala	Arg	Leu	Gln	Leu	His	Lys	Thr	Glu	Phe	Leu	Gly	Lys	Glu
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Met	Lys	Leu	Tyr	Phe	Ala	Gln	Thr	Leu	His	Ile	Gly	Ser	Ser	His	Leu
			85					90						95	

Ala	Pro	Pro	Asn	Pro	Asp	Lys	Gln	Phe	Leu	Ile	Ser	Pro	Pro	Ala	Ser
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Tyr Asp Leu Leu Tyr Ala Ile Ser Lys Leu Gly Pro Gly Glu Lys Tyr
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Glu Leu His Ala Ala Thr Asp Thr Thr Pro Ser Val Val Val His Val
145 150 155 160

Cys Glu Ser Asp Gln Glu Lys Glu Glu Glu Glu Glu Met Glu Arg Met
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Arg Arg Pro Lys Pro Lys Ile Ile Gln Thr Arg Arg Pro Glu Tyr Thr
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Pro Ile His Leu Ser
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aaa ttt ggg gga ctg ttt cgg act tat gat gac tgt gtg acg ttc cag 327
Lys Phe Gly Gly Leu Phe Arg Thr Tyr Asp Asp Cys Val Thr Phe Gln
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cta ttt aag agt ttc aga cgt gtc cgt ata aac ttc agc aat cct aaa 375
Leu Phe Lys Ser Phe Arg Arg Val Arg Ile Asn Phe Ser Asn Pro Lys

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 Lys Lys Leu Lys Leu Tyr Phe Ala Gln Val Gln Thr Pro Glu Thr Asp
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 Gly Asp Lys Leu His Leu Ala Pro Pro Gln Pro Ala Lys Gln Phe Leu
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atc tcg ccc cct tcc tcc cca cct gtt agc tgg cag ccc atc aac gat 567
 Ile Ser Pro Pro Ser Ser Pro Pro Val Ser Trp Gln Pro Ile Asn Asp
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gga cca gga gag aag tat gag ctc cat gca ggg act gag tcc acc cca 663
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105

110

Pro Val Ser Trp Gln Pro Ile Asn Asp Ala Thr Pro Val Leu Asn Tyr
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Asp Leu Leu Tyr Ala Val Ala Lys Leu Gly Pro Gly Glu Lys Tyr Glu
130 135 140

Leu His Ala Gly Thr Glu Ser Thr Pro Ser Val Val Val His Val Cys
145 150 155 160

Asp Ser Asp Ile Glu Glu Glu Glu Asp Pro Lys Thr Ser Pro Lys Pro
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Lys Ile Ile Gln Thr Arg Arg Pro Gly Leu Pro Pro Ser Val Ser Asn
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<211> 192

<212> PRT

<213> Homo sapiens

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Thr Tyr Asp Asp Cys Val Thr Phe Gln Leu Phe Lys Ser Phe Arg Arg
35 40 45

Val Arg Ile Asn Phe Ser Asn Pro Lys Ser Ala Ala Arg Ala Arg Ile
50 55 60

Glu Leu His Glu Thr Gln Phe Arg Gly Lys Lys Leu Lys Leu Tyr Phe
65 70 75 80

Ala Gln Val Gln Thr Pro Glu Thr Asp Gly Asp Lys Leu His Leu Ala
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Pro Pro Gln Pro Ala Lys Gln Phe Leu Ile Ser Pro Pro Ser Ser Pro
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Pro Val Ser Trp Gln Pro Ile Asn Asp Ala Thr Pro Val Leu Asn Tyr
115 120 125

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Asp Leu Leu Tyr Ala Val Ala Lys Leu Gly Pro Gly Glu Lys Tyr Glu
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Leu His Ala Gly Thr Glu Ser Thr Pro Ser Val Val Val His Val Cys
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atg att ttt ggt gaa aat gaa gat gat ttg gat gag atg atg gat tta 148
 Met Ile Phe Gly Glu Asn Glu Asp Asp Leu Asp Glu Met Met Asp Leu
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 Ser Asp Leu Pro Thr Ser Leu Phe Ala Cys Ser Val His Glu Ala Val
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ttt gag gca cga gag cag aag gaa aga ttt gaa gca ctc ttc acc atc 244
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<212> PRT

<213> Homo sapiens

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Leu Phe Ala Cys Ser Val His Glu Ala Val Phe Glu Ala Arg Glu Gln
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Lys Glu Arg Phe Glu Ala Leu Phe Thr Ile Tyr Asp Asp Gln Val Thr
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Phe Gln Leu Phe Lys Ser Phe Arg Arg Val Arg Ile Asn Phe Ser Lys
85 90 95

Pro Glu Ala Ala Ala Arg Ala Arg Ile Glu Leu His Glu Thr Asp Phe
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Asn Gly Gln Lys Leu Lys Leu Tyr Phe Ala Gln Val Gln Met Ser Gly
115 120 125

Glu Val Arg Asp Lys Ser Tyr Leu Leu Pro Pro Gln Pro Val Lys Gln
130 135 140

Phe Leu Ile Ser Pro Pro Ala Ser Pro Pro Val Gly Trp Lys Gln Ser
145 150 155 160

Glu Asp Ala Met Pro Val Ile Asn Tyr Asp Leu Leu Cys Ala Val Ser
165 170 175

Lys Leu Gly Pro Gly Glu Lys Tyr Glu Leu His Ala Gly Thr Glu Ser
180 185 190

Thr Pro Ser Val Val Val His Val Cys Glu Ser Glu Thr Glu Glu Glu
195 200 205

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Leu

<210> 22
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Phe Gln Leu Phe Lys Ser Phe Arg Arg Val Arg Ile Asn Phe Ser Lys
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Pro Glu Ala Ala Ala Arg Ala Arg Ile Glu Leu His Glu Thr Asp Phe
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115 120 125
Glu Val Arg Asp Lys Ser Tyr Leu Leu Pro Pro Gln Pro Val Lys Gln
130 135 140
Phe Leu Ile Ser Pro Pro Ala Ser Pro Pro Val Gly Trp Lys Gln Ser
145 150 155 160
Glu Asp Ala Met Pro Val Ile Asn Tyr Asp Leu Leu Cys Ala Val Ser
165 170 175
Lys Leu Gly Pro Gly Glu Lys Tyr Glu Leu His Ala Gly Thr Glu Ser
180 185 190

Thr Pro Ser Val Val Val His Val Cys Glu Ser Glu Thr Glu Glu Glu
195 200 205

Glu Glu Thr Lys Asn Pro Lys Gln Lys Ile Ala Gln Thr Arg Arg Pro
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Asp Pro Pro Thr Ala Ala Leu Asn Glu Pro Gln Thr Phe Asp Cys Ala
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Leu

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Leu Asp Glu Met Met Asp Leu Ser Asp Leu Pro Thr Ser Leu Phe Ala
20 25 30

tgc agc gtc cat gaa gca gtg ttt gag gca cga gag cag aag gaa aga 145
Cys Ser Val His Glu Ala Val Phe Glu Ala Arg Glu Gln Lys Glu Arg
35 40 45

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Phe Lys Ser Phe Arg Arg Val Arg Ile Asn Phe Ser Lys Pro Glu Ala
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Ala Ala Arg Ala Arg Ile Glu Leu His Glu Thr Asp Phe Asn Gly Gln
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Phe Glu Ala Leu Phe Thr Ile Tyr Asp Asp Gln Val Thr Phe Gln Leu
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Phe Lys Ser Phe Arg Arg Val Arg Ile Asn Phe Ser Lys Pro Glu Ala
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Ala Ala Arg Ala Arg Ile Glu Leu His Glu Thr Asp Phe Asn Gly Gln
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Lys Leu Lys Leu Tyr Phe Ala Gln Ser Tyr Leu Leu Pro Pro Gln Pro
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Val Lys Gln Phe Leu Ile Ser Pro Pro Ala Ser Pro Pro Val Gly Trp
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Lys Gln Ser Glu Asp Ala Met Pro Val Ile Asn Tyr Asp Leu Leu Cys
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Ala Val Ser Lys Leu Gly Pro Gly Glu Lys Tyr Glu Leu His Ala Gly
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Thr Glu Ser Thr Pro Ser Val Val Val His Val Cys Glu Ser Glu Thr
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Glu Glu Glu Glu Glu Thr Lys Asn Pro Lys Gln Lys Ile Ala Gln Thr
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Asp Cys Ala Leu
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